Hisanori NAKAJIMA Q8099
DOT DATA CREATION PROCESS WITH SAVED.....
Filing Date: February 25, 2004
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Fig.1

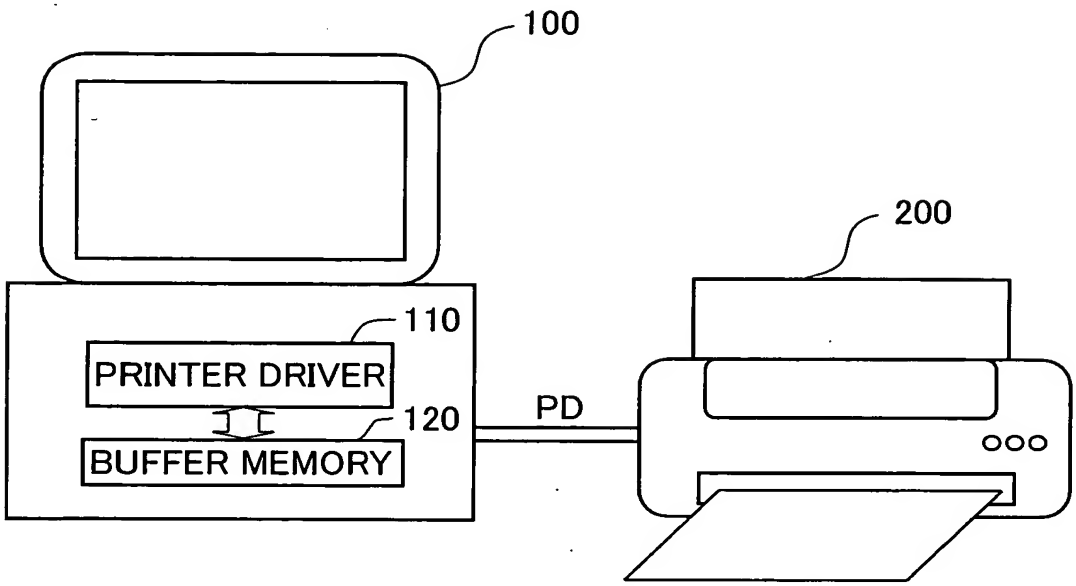


Fig.2(A)

COLOR IMAGE DATA

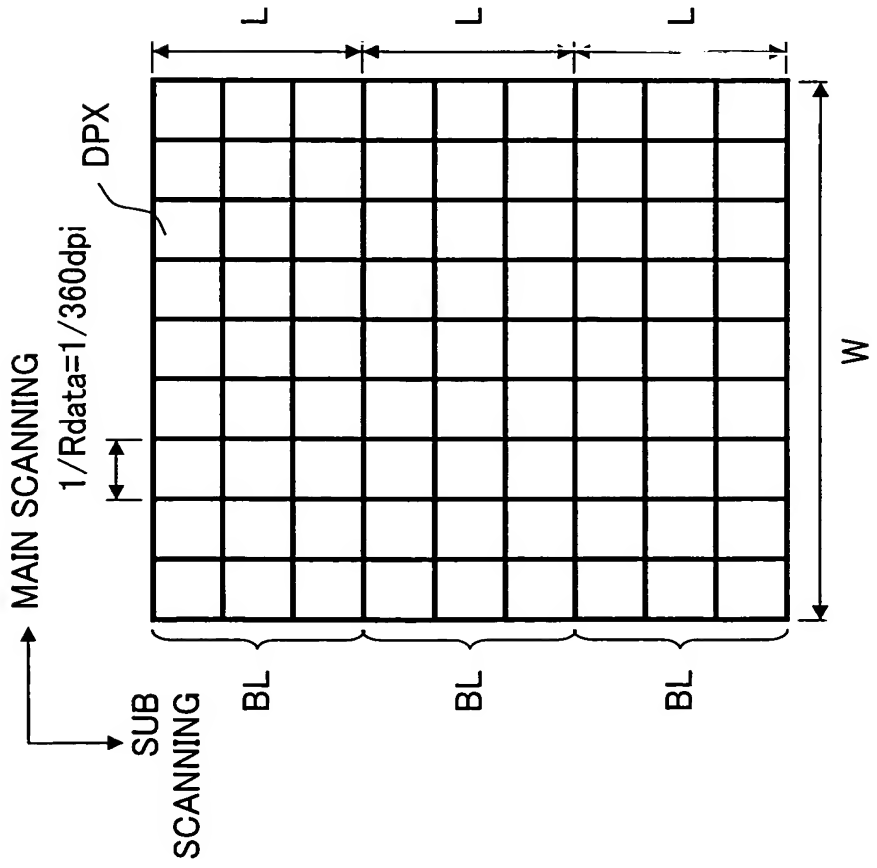


Fig.2(B)

PRINT DATA PD (DOT DATA)

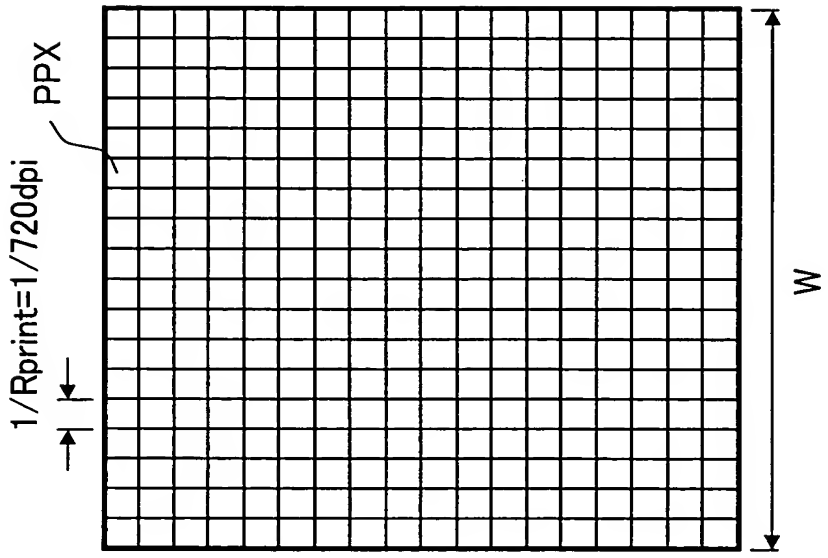
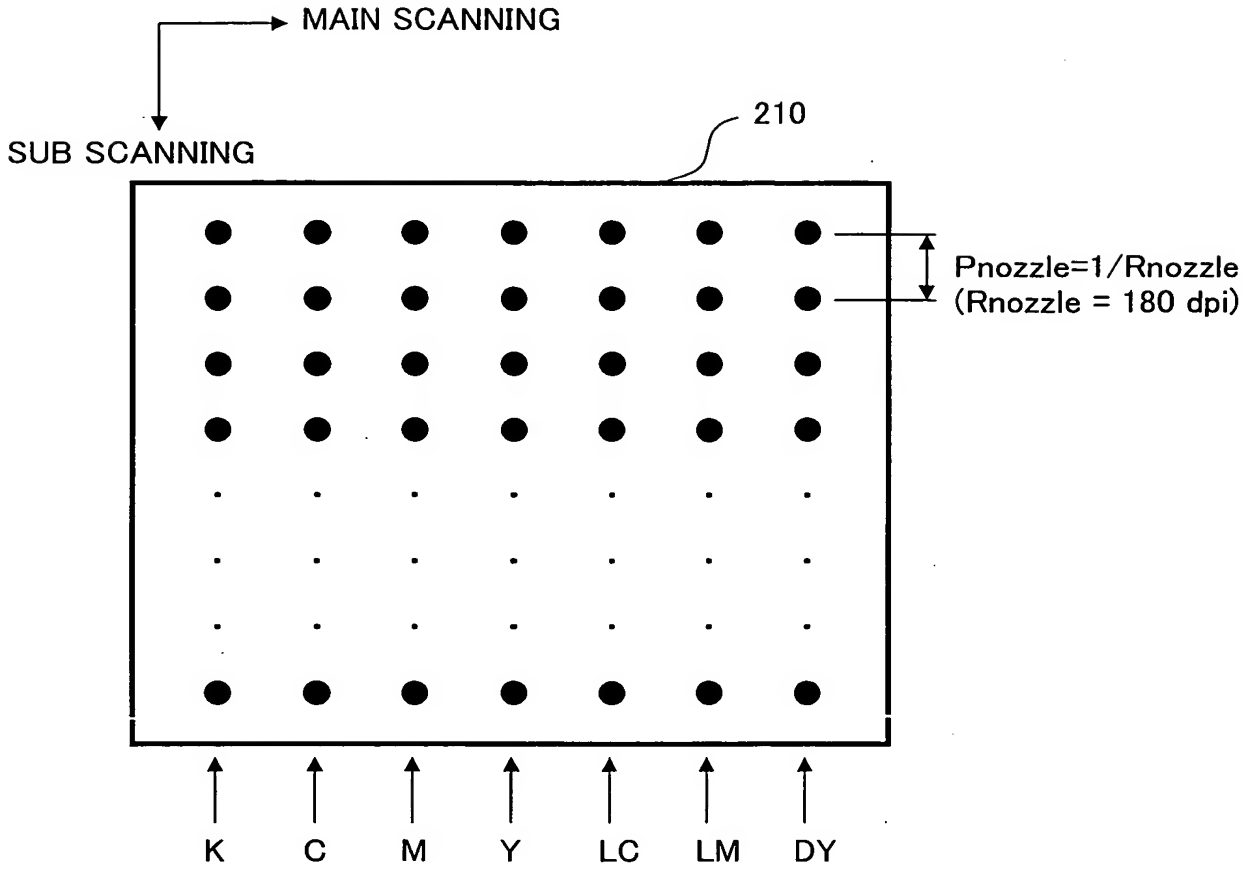


Fig.3


MAIN SCANNING
SUB SCANNING
210
Pnozzle=1/Rnozzle
(Rnozzle = 180 dpi)
K
C
M
Y
LC
LM
DY

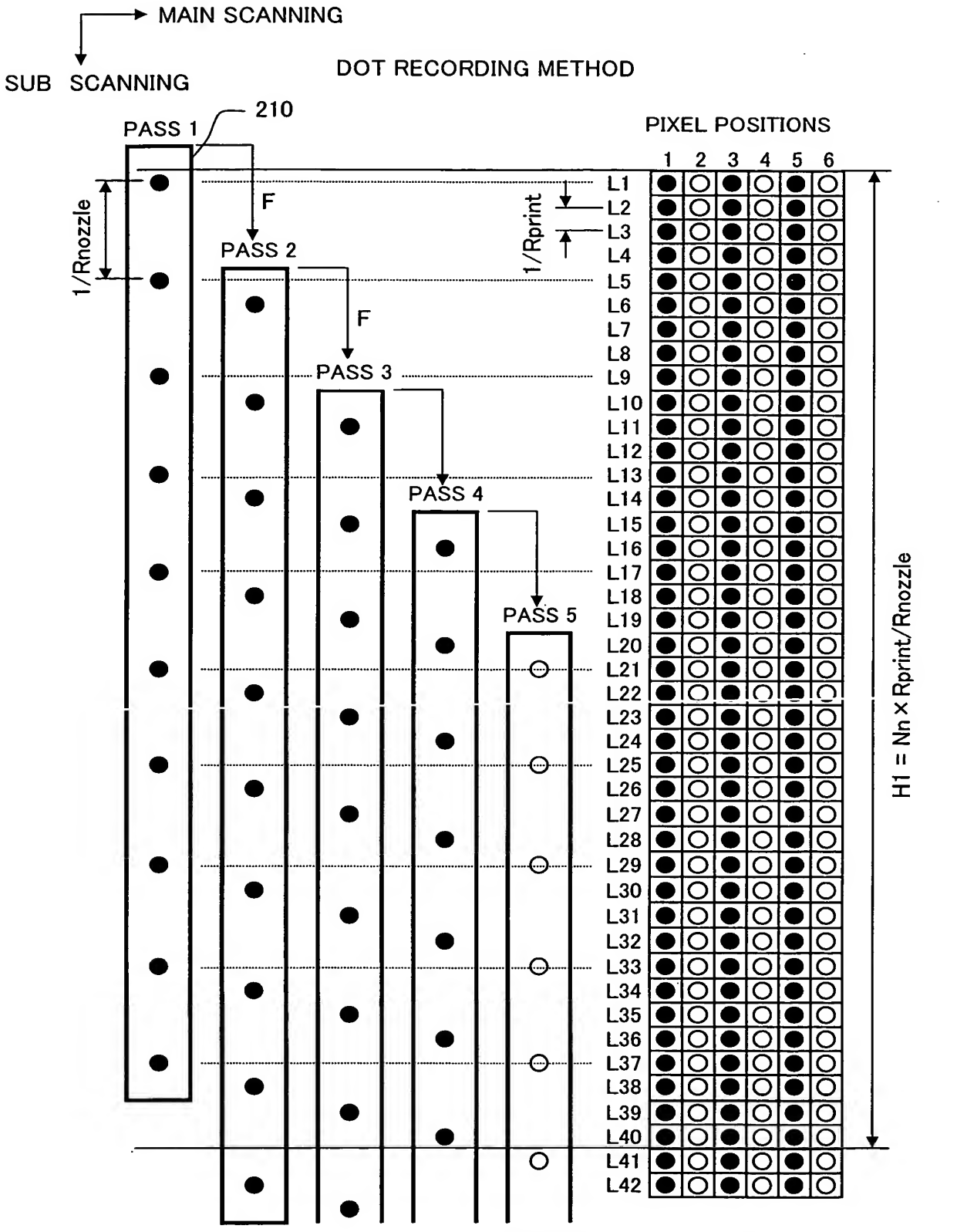
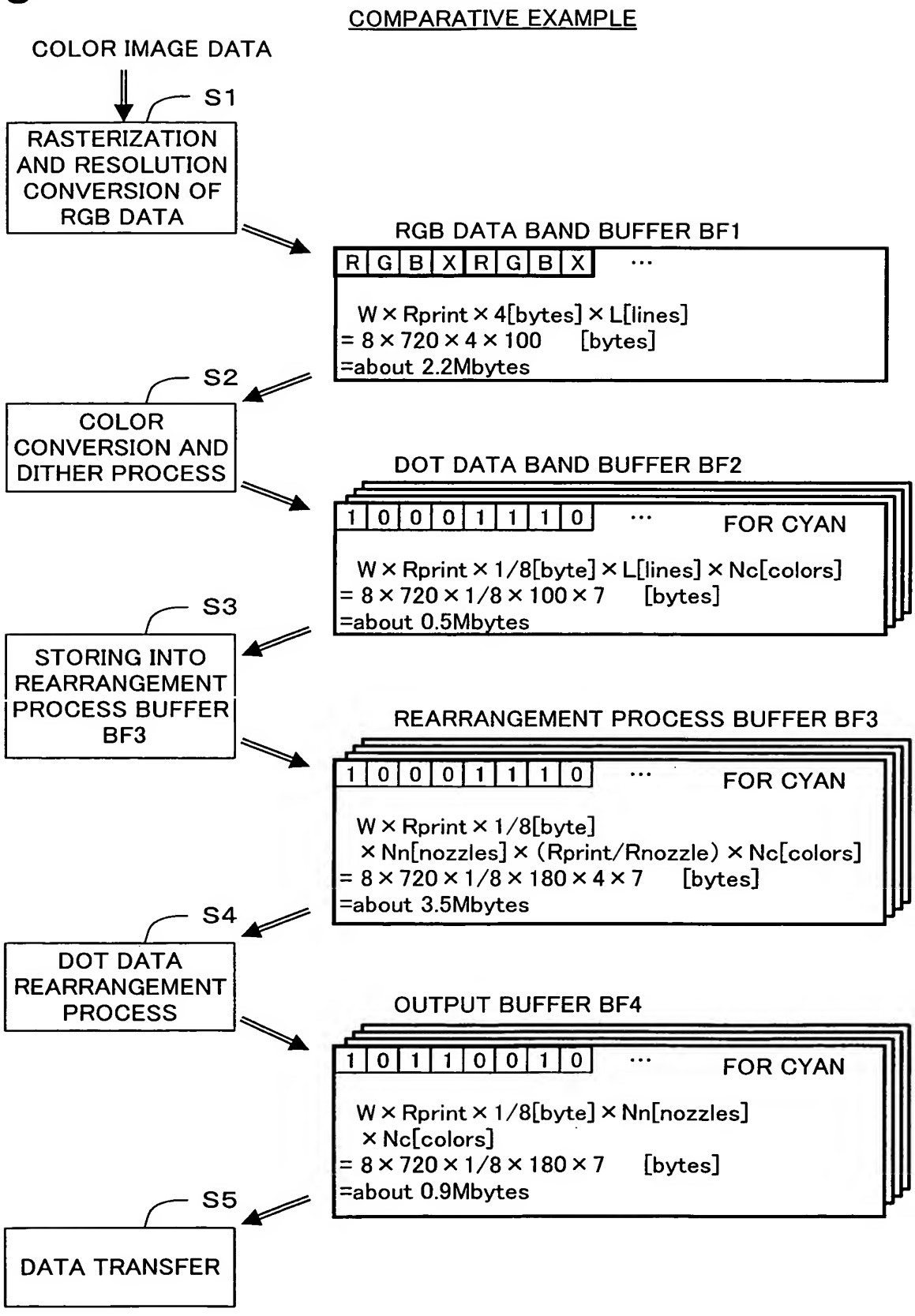


Fig.4

NUMBER OF USED NOZZLES: Nn
NOZZLE RESOLUTION: Rnozzle = 180dpi
PRINTING RESOLUTION: Rprint = 720 dpi

Fig.5


COMPARATIVE EXAMPLE
COLOR IMAGE DATA
S1
RASTERIZATION AND RESOLUTION CONVERSION OF RGB DATA
RGB DATA BAND BUFFER BF1
R G B X R G B X ...
W × Rprint × 4[bytes] × L[lines]
= 8 × 720 × 4 × 100 [bytes]
=about 2.2Mbytes
S2
COLOR CONVERSION AND DITHER PROCESS
DOT DATA BAND BUFFER BF2
1 0 0 0 1 1 1 0 ... FOR CYAN
W × Rprint × 1/8[byte] × L[lines] × Nc[colors]
= 8 × 720 × 1/8 × 100 × 7 [bytes]
=about 0.5Mbytes
S3
STORING INTO REARRANGEMENT PROCESS BUFFER BF3
REARRANGEMENT PROCESS BUFFER BF3
1 0 0 0 1 1 1 0 ... FOR CYAN
W × Rprint × 1/8[byte]
× Nn[nozzles] × (Rprint/Rnozzle) × Nc[colors]
= 8 × 720 × 1/8 × 180 × 4 × 7 [bytes]
=about 3.5Mbytes
S4
DOT DATA REARRANGEMENT PROCESS
OUTPUT BUFFER BF4
1 0 1 1 0 0 1 0 ... FOR CYAN
W × Rprint × 1/8[byte] × Nn[nozzles]
× Nc[colors]
= 8 × 720 × 1/8 × 180 × 7 [bytes]
=about 0.9Mbytes
S5
DATA TRANSFER

COMPARATIVE EXAMPLE

Fig.6(A)

REARRANGEMENT PROCESS BUFFER BF3

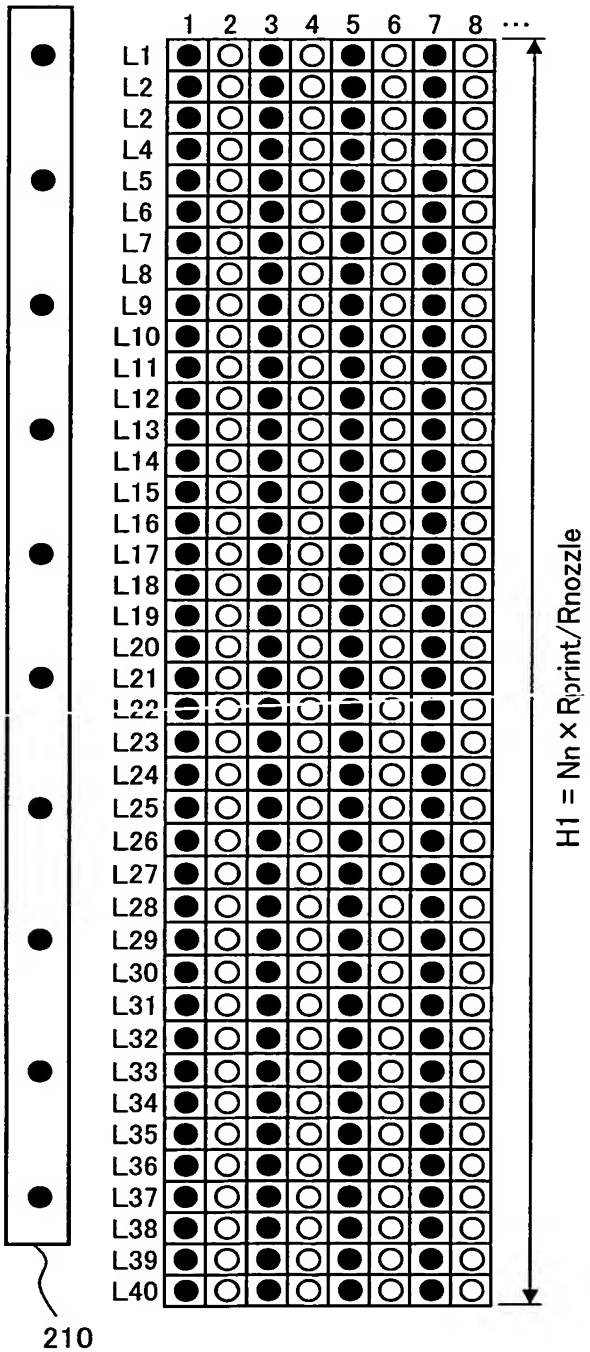


Fig.6(B)

OUTPUT BUFFER BF4

	1	2	3	4	5	6	7	8
L1	●	–	●	–	●	–	●	–
L5	●	–	●	–	●	–	●	–
L9	●	–	●	–	●	–	●	–
L13	●	–	●	–	●	–	●	–
L17	●	–	●	–	●	–	●	–
L21	●	–	●	–	●	–	●	–
L25	●	–	●	–	●	–	●	–
L29	●	–	●	–	●	–	●	–
L33	●	–	●	–	●	–	●	–
L37	●	–	●	–	●	–	●	–

●:DOTS SUBJECT TO RECORDING ON PASS 1
—:DUMMY DATA

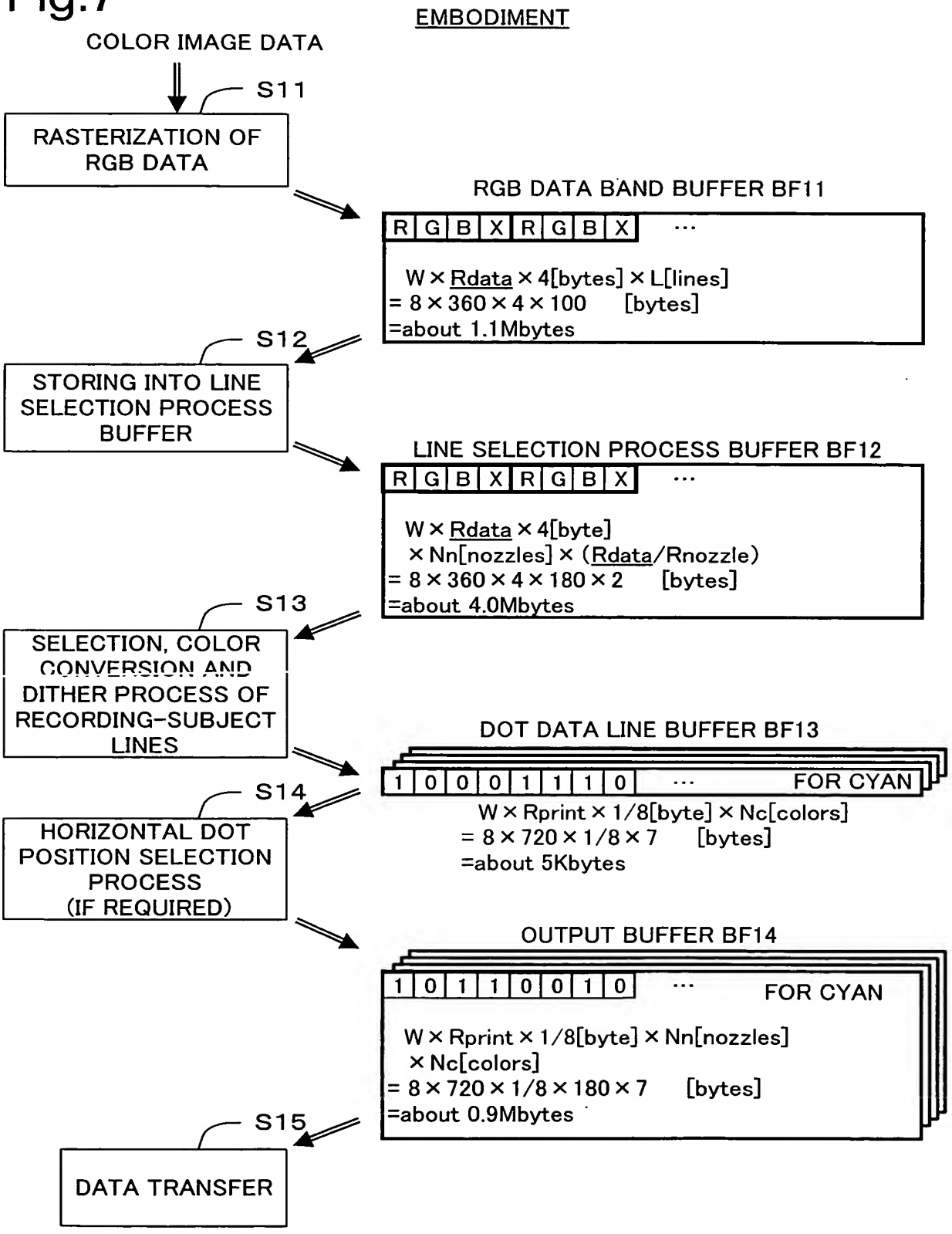
Fig.6(C)

OUTPUT BUFFER BF4'

	1	3	5	7
L1	●	●	●	●
L5	●	●	●	●
L9	●	●	●	●
L13	●	●	●	●
L17	●	●	●	●
L21	●	●	●	●
L25	●	●	●	●
L29	●	●	●	●
L33	●	●	●	●
L37	●	●	●	●

●:DOTS SUBJECT TO RECORDING ON PASS 1

Fig.7


EMBODIMENT
COLOR IMAGE DATA
S11
RASTERIZATION OF RGB DATA
RGB DATA BAND BUFFER BF11
R G B X R G B X ...
W × Rdata × 4[bytes] × L[lines]
= 8 × 360 × 4 × 100 [bytes]
=about 1.1Mbytes
S12
STORING INTO LINE SELECTION PROCESS BUFFER
LINE SELECTION PROCESS BUFFER BF12
R G B X R G B X ...
W × Rdata × 4[byte]
× Nn[nozzles] × (Rdata/Rnozzle)
= 8 × 360 × 4 × 180 × 2 [bytes]
=about 4.0Mbytes
S13
SELECTION, COLOR CONVERSION AND DITHER PROCESS OF RECORDING-SUBJECT LINES
DOT DATA LINE BUFFER BF13
1 0 0 0 1 1 1 0 ... FOR CYAN
W × Rprint × 1/8[byte] × Nc[colors]
= 8 × 720 × 1/8 × 7 [bytes]
=about 5Kbytes
S14
HORIZONTAL DOT POSITION SELECTION PROCESS (IF REQUIRED)
OUTPUT BUFFER BF14
1 0 1 1 0 0 1 0 ... FOR CYAN
W × Rprint × 1/8[byte] × Nn[nozzles]
× Nc[colors]
= 8 × 720 × 1/8 × 180 × 7 [bytes]
=about 0.9Mbytes
S15
DATA TRANSFER

EMBODIMENT

Fig.8(A)

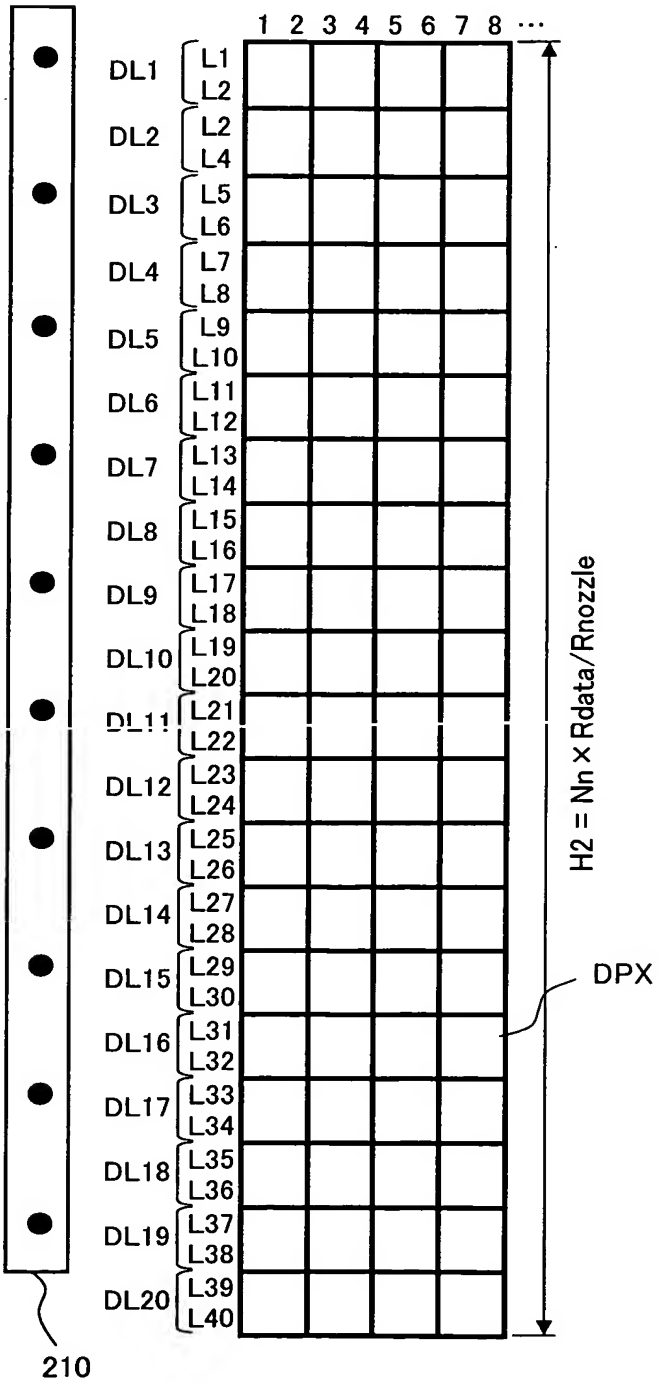
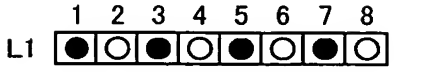
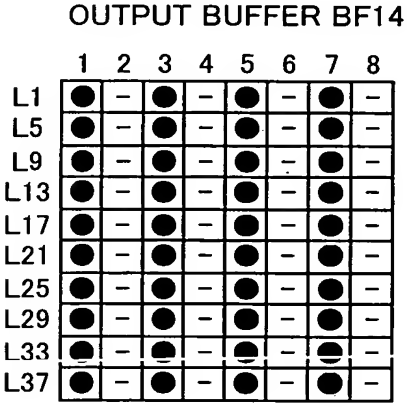


Fig.8(B)



●:DOTS SUBJECT TO RECORDING ON PASS 1
○:DOTS SUBJECT TO RECORDING ON OTHER PASSES

Fig.8(C)



●:DOTS SUBJECT TO RECORDING ON PASS 1
—:DUMMY DATA

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Fig.9

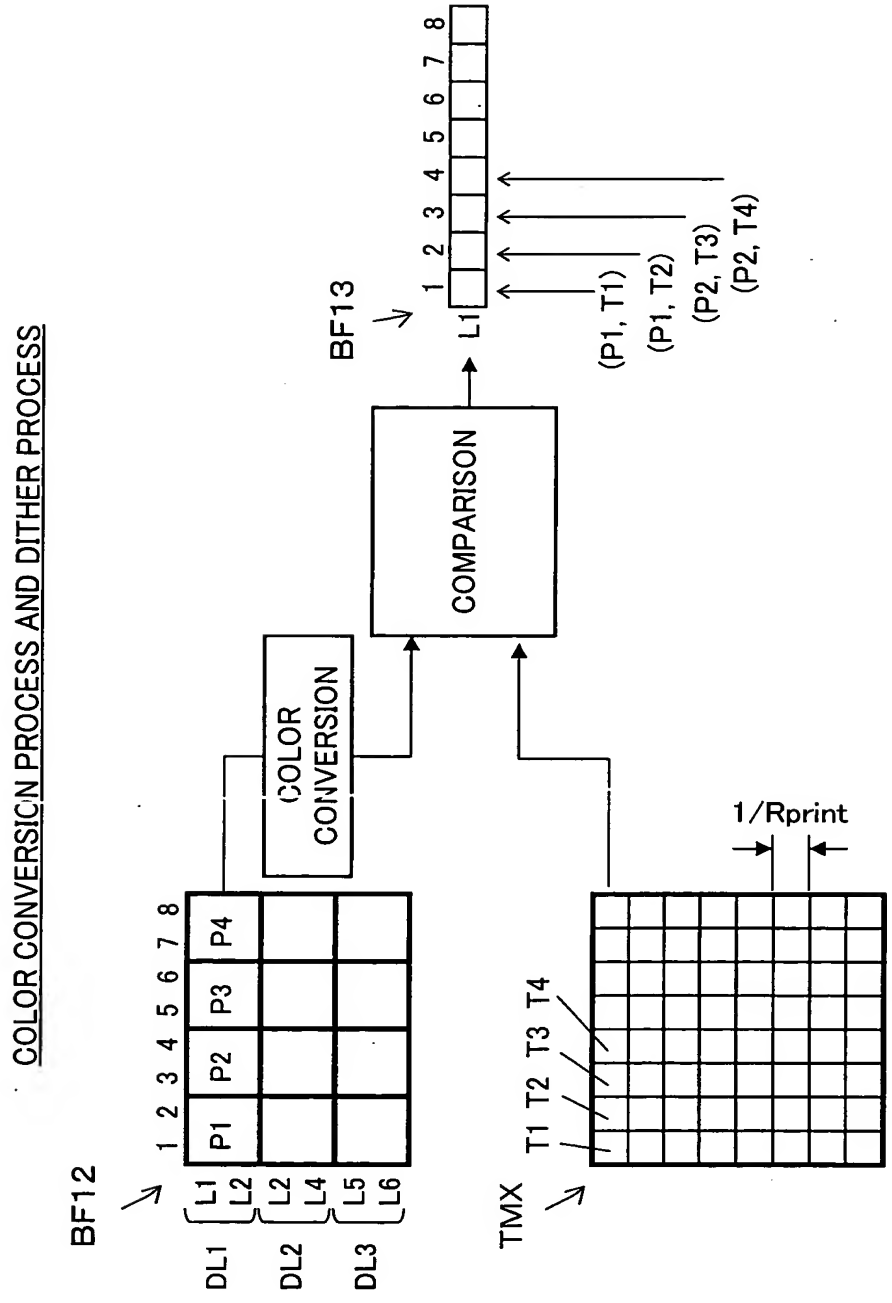

Fig.10(A)

BUFFER CAPACITY ACCORDING TO COMPARATIVE EXAMPLE

TYPE OF BUFFER MEMORY	BUFFER CAPACITY [bytes]	PRINTING RESOLUTION Rprint		
		720	1440	2880
RGB DATA BAND BUFFER BF1	W × Rprint × 4[bytes] × L[lines]	2.2	4.4	8.8
DOT DATA BAND BUFFER BF2	W × Rprint × 1/8[byte] × L[lines] × Nc[colors]	0.5	1.0	1.9
REARRANGEMENT PROCESS BUFFER BF3	W × Rprint × 1/8[byte] × Nn[nozzles] × (Rprint/Rnozzle) × Nc[colors]	3.5	13.8	55.4
OUTPUT BUFFER BF4	W × Rprint × 1/8[byte] × Nn[nozzles] × Nc[colors]	0.9	1.7	3.5
TOTAL [Mbytes]	(Assuming that W = 8, L = 100, Nc = 8, Nn = 180, and Rnozzle = 180)	7.1	20.9	69.6

Fig.10(B)

BUFFER CAPACITY ACCORDING TO EMBODIMENT

TYPE OF BUFFER MEMORY	BUFFER CAPACITY [bytes]	PRINTING RESOLUTION Rprint		
		720	1440	2880
RGB DATA BAND BUFFER BF11	W × Rdata × 4[bytes] × L[lines]	1.1	2.2	4.4
LINE SELECTION PROCESS BUFFER BF12	W × Rdata × 4[bytes] × Nc[nozzles] × (Rdata/Rnozzle)	4.0	4.0	4.0
DOT DATA LINE BUFFER BF13	W × Rprint × 1/8[byte] × Nc[colors]	0.005	0.01	0.02
OUTPUT BUFFER BF14	W × Rprint × 1/8[byte] × Nn[nozzles] × Nc[colors]	0.9	1.7	3.5
TOTAL [Mbytes]	(Assuming that W = 8, L = 100, Nc = 8, Nn = 180, Rdata = 360, and Rnozzle = 180)	6.0	7.9	11.9